

4. That as *Th. punctata* is one of the Protozoa, it most probably has a reproductive stage.

5. That *Th. nucleata* might readily be derived from such an alteration in one of the cells of *Th. punctata* as occurs in the sponge-cells when they go to form the seed-like body, or in the Gregarina-cells when they become "Navicella-sacs."

6. That *Thalassicolla nucleata* is essentially similar in structure to *Noctiluca*.

Finally, I may be permitted to say, that no one can be more fully conscious than myself of the slender and hypothetical grounds on which some of these conclusions rest. My chief purpose has been merely to show the tendency of the evidence now extant as clearly and broadly as possible;—rather to draw out a brief than to pronounce a judgment.

The following are the authorities referred to in the text:—

VON SIEBOLD. Vergleichende Anatomie d. Wirbellosen Thiere, p. 7–25.

———. Ueber einzellige Pflanzen u. Thiere. *Siebold und Kölliker's Zeitschrift*, 1849.

DUJARDIN. Histoire naturelle des Zoophytes Infusoires.

COHN. Nachträge zur Naturgeschichte des Protococcus fluviatilis. *Nova Acta Acad. Nat. Cur.* 1850.

PINEAU. Sur le Développement des Infusoires. *Annales des Sciences*, 1845.

STEIN. Untersuchungen über die Entwicklung d. Infusorien. *Wiegmann's Archiv*, 1849.

———. Ueber die Natur d. Gregarinen. *Müller's Archiv*, 1848.

KÖLLIKER. Ueber die Gattung Gregarina. *Siebold und Kölliker's Zeitschrift*, 1848.

———. Das Sonnenthierchen. *Ditto*. 1849.

QUATREFAGES. Observations sur les Noctiluques. *Annales des Sciences*, 1851.

HOGG. Upon Spongilla. *Trans. Linn. Soc.* vol. xviii.

CARTER. On Spongilla. *Annals of Nat. Hist.* 1849.

XXXV.—*A Catalogue of British Spiders, including remarks on their Structure, Functions, Economy and Systematic Arrangement.* By JOHN BLACKWALL, F.L.S.

[Continued from p. 339.]

87. *Theridion nervosum*.

Theridion nervosum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 301; Hahn, Die Arachn. B. ii. p. 48. tab. 58. fig. 133.

——— *sisyphus*, Sund. Vet. Acad. Handl. 1831, p. 115.

Theridium sisypus, Koch, Uebers. des Arachn. Syst. erstes Heft, p. 8; Die Arachn. B. viii. p. 73. tab. 273. fig. 644.

Titulus 13, Lister, Hist. Animal. Angl. De Aran. p. 51. tab. 1. fig. 13.

A complex snare, having somewhat of a pyramidal form, is spun on trees, shrubs, gorse bushes and heath by this common spider, which is widely distributed in Great Britain. It pairs in June, and in July the female constructs a globular cocoon of dull green silk of a loose texture, measuring $\frac{1}{8}$ th of an inch in diameter, which includes from 30 to 40 small, yellowish white, spherical eggs, not adherent among themselves. This cocoon is placed under a shallow dome-shaped canopy of silk, about which withered leaves, flowers, and the remains of insects are accumulated; it is situated among the foliage near the upper part of the snare, and in this nidus the young live amicably together with the female till they are capable of providing for themselves, when they separate.

Like its congeners, this species envelopes with lines drawn from the spinners by means of the posterior legs such insects as are too powerful for it to attack when first entangled in its toils.

88. *Theridion denticulatum*.

Theridion denticulatum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 305; Blackw. Linn. Trans. vol. xix. p. 124.

Branches of trees and shrubs trained against buildings, and crevices in rocks and walls are the situations usually occupied by this species. The female, in the month of June or July, attaches to objects near her retreat a globular cocoon of greenish brown silk of a very loose texture, measuring $\frac{1}{7}$ th of an inch in diameter, in which she deposits from 30 to 60 spherical eggs of a brown colour, not agglutinated together.

89. *Theridion varians*.

Theridion varians, Hahn, Die Arachn. B. i. p. 93. tab. 22. fig. 71, 72; Walck. Hist. Nat. des Insect. Apt. t. ii. p. 314.

Theridium varians, Koch, Die Arachn. B. xii. p. 134. tab. 428. fig. 1056-1058.

Theridion varians occurs in localities similar to those frequented by *Theridion denticulatum* and is a common British spider. It pairs in June, and in July the female constructs several globular cocoons of dull white silk of a very loose texture, the largest of which measures about $\frac{1}{7}$ th of an inch in diameter; they are attached to objects situated near the upper part of the snare, and contain, according to their size, from 20 to 60 spherical eggs of a yellowish white colour, not adherent among themselves. Withered leaves, dried moss, and particles of indurated earth are generally disposed about the cocoons.

Of the three figures of *Theridion varians*, 1056, 1057 and 1058, given by M. Koch in the twelfth volume of 'Die Arach-

niden,' M. Walckenaer has placed the first and second among the synonyma of *Theridion denticulatum*, and the third among those of *Theridion tinctum*; he has also referred to fig. 1056 as a portrait of a female, whereas it most unequivocally represents a male. My own observations serve to confirm the accuracy of the view taken by M. Koch.

90. *Theridion pulchellum*.

Theridion pulchellum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 311.

— *formosum*, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. x. p. 101.

Theridium vittatum, Koch, Die Arachn. B. iii. p. 65. tab. 94. fig. 217; Die Arachn. B. iv. p. 118. tab. 141. fig. 326.

This species is found in summer and autumn on rails and gates about Oakland. The plan of its snare is similar to that on which the snares of other *Theridia* are constructed. In June the female deposits about 29 spherical eggs of a yellowish white colour, not adherent among themselves, in a globular cocoon of white silk of a fine but compact texture, measuring $\frac{1}{8}$ th of an inch in diameter. Near the cocoon, which is sometimes attached to the under side of a leaf by fine lines of silk, she takes her station, and on the approach of danger endeavours to secure her treasure by seizing it with her falces, palpi, and feet.

91. *Theridion carolinum*.

Theridion carolinum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 315.

— *dorsiger*, Hahn, Die Arachn. B. i. p. 82. tab. 20. fig. 61 (mis-numbered 60 in the plate).

Linyphia bimaculata, Koch, Uebers. des Arachn. Syst. erstes Heft, p. 10.

I have taken this rare spider among grass near woods at Oakland. In June the female fabricates a globular cocoon of white silk of a slight texture, measuring $\frac{1}{10}$ th of an inch in diameter, in which she deposits about 50 spherical eggs of a pale yellowish white colour, not agglutinated together. The cocoon is attached to the spinners by short silken lines, and is transported with her wherever she goes, in the manner of the *Lycosæ*.

92. *Theridion versutum*.

Theridion versutum, Blackw. Annals and Mag. of Nat. Hist. vol. xviii. p. 302.

The only specimen of this species which has come under my observation was a male; it was captured in the neighbourhood of Winchester in July 1846 by James Franklin Preston, Esq.,

and was comprised in a collection of *Araneidea* obligingly made for me by that gentleman in Hampshire and the Isle of Wight.

93. *Theridion pallens*.

Theridion pallens, Blackw. Research. in Zool. p. 357.

Epëira nubila, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. x. p. 101.

Bushes and coarse herbage growing in the vicinity of woods in Lancashire and Denbighshire are frequented by this minute species of *Theridion*. It pairs in May, and in June the female deposits about 20 spherical eggs of a pale yellowish colour in a small globular cocoon of white silk of a loose texture.

The female, both when adolescent and adult, has a design of a dark brown colour on the upper part of the abdomen, which almost disappears after she has deposited her eggs. The male differs from her so widely in structure and colour that I was induced to describe it in the 'London and Edinburgh Philosophical Magazine' as an *Epëira*, under the specific name of *nubila*. A knowledge of its habits and œconomy, subsequently acquired, has enabled me to correct this error.

94. *Theridion fuscum*.

Theridion fuscum, Blackw. Linn. Trans. vol. xviii. p. 626.

M. Walckenaer appears to regard *Theridion fuscum* as identical with *Argus formivorus* (Hist. Nat. des Insect. Apt. t. iv. p. 502), from which it differs in size, structure and colour, presenting all the essential characters of a *Theridion*.

Females of this species may be found towards the close of the year on rails and under stones in pastures near Llanrwst.

95. *Theridion albens*.

Theridion albens, Blackw. Linn. Trans. vol. xviii. p. 627; Walck. Hist. Nat. des Insect. Apt. t. iv. p. 492.

A female of this minute spider was discovered in July 1837 among strawberry plants in my father's garden at Hendre House, near Llanrwst.

96. *Theridion angulatum*.

Theridion angulatum, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. viii. p. 483.

A single specimen of this remarkable species was detected in a cleft of a rail at Oakland, in April 1835. It was a female, and, like *Tetragnatha extensa*, frequently extended the first and second pairs of legs forwards, and the fourth pair backwards, in a line with the body.

97. *Theridion variegatum*.

Theridion variegatum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 332.

— *thoracicum*, Wider, Museum Senckenb. B. i. p. 218. taf. 14. fig. 11.

— *callens*, Blackw. Linn. Trans. vol. xviii. p. 627.

Ero variegata, Koch, Uebers. des Arachn. Syst. erstes Heft, p. 8.

In the fourth volume of his 'Hist. Nat. des Insect. Apt.' p. 496, M. Walckenaer has very properly added the name *Theridion callens*, conferred by me on a small spider described in the 'Transactions of the Linnæan Society,' to the synonyma of *Theridion variegatum*, a correction which I had previously made in my MS. catalogue of British spiders, having satisfied myself, by referring to Herrich Schæffer's 'Deutschlands Insecten,' Heft 138, fig. 5, 6, that the *Ero variegata* of M. Koch is identical with *Theridion callens*, and, like it, must become a synonym of *Theridion variegatum*.

This species occurs among grass growing in and near woods in the west of Denbighshire. The female fabricates a very remarkable balloon-shaped cocoon, about $\frac{1}{8}$ th of an inch in diameter, which is composed of soft silk of a loose texture and pale brown colour, inclosed in an irregular network of coarse dark red-brown filaments; several of the lines composing this network unite near the smaller extremity of the cocoon, leaving intervals there through which the young pass when they quit it, and being cemented together throughout the remainder of their extent, form a slender stem, varying from $\frac{1}{10}$ th to $\frac{1}{2}$ of an inch in length, by which the cocoon is attached to the surface of stones and fragments of rock, resembling in its figure and erect position some of the minute plants belonging to the class *Cryptogamia*. The eggs are large, considering the small size of the spider, five or six in number, spherical, not agglutinated together, and of a brown colour.

From a cocoon of *Theridion variegatum* transmitted to me in July 1851 by R. H. Meade, Esq., of Bradford, Yorkshire, in which locality it was found, eight young spiders had made their escape; they were included in the small box containing the cocoon.

98. *Theridion signatum*.

Theridion signatum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 333; Blackw. Linn. Trans. vol. xix. p. 124.

— *quadrismatum*, Hahn, Die Arachn. B. i. p. 80. tab. 20. fig. 60 (misnumbered 59 in the plate).

Drassus phaleratus, Sund. Vet. Acad. Handl. 1831, p. 133.

Asagena phalerata, Sund. Consp. Arachn. p. 19, 20.

— *serratipes*, Koch, Uebers. des Arachn. Syst. erstes Heft, p. 13; Die Arachn. B. vi. p. 98. tab. 204. fig. 502, 503.

Some difference of opinion has existed among arachnologists as to the position this spider should occupy in a systematic arrangement of the *Araneidea*; but I do not see any sufficient reason for removing it from the *Theridia*, to which it appears to be most nearly allied by its organization.

In Denbighshire this species is found among heath, but it is of rare occurrence. The radial and digital joints of the palpi are so closely connected in the male as scarcely to present any perceptible trace of their union; in short, as they appear to be incapable of separate motion, there seems to be an impropriety in regarding them as distinct joints.

99. *Theridion filipes*.

Theridion filipes, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. viii. p. 484.

Linyphia concolor, Wider, Museum Senckenb. B. i. p. 267. taf. 18. fig. 3; Walck. Hist. Nat. des Insect. Apt. t. ii. p. 270.

Theridion filipes is allied to the spiders belonging to the genus *Neriène* by the disposition and relative size of its eyes, and to those of the genus *Linyphia* by the length and delicacy of its limbs; indeed, on a superficial view, it bears a striking resemblance to *Linyphia tenuis*; but the structure of the maxillæ and the relative length of the legs have induced me to class it with the *Theridia*. It occurs under stones in woods in Denbighshire and Lancashire.

The first individual examined by me was a female, and it presented an anomaly in organization which I never before witnessed in this order of animals; it had a supernumerary eye situated between the two small ones constituting the anterior pair of the trapezoid.

M. Walckenaer has inadvertently placed the *Linyphia concolor* of M. Wider, which is identical with *Theridion filipes*, among the synonyma of *Argus graminicolis*, having previously described it as a distinct species under the name conferred upon it by M. Wider (Hist. Nat. des Insect. Apt. t. ii. pp. 270, 351).

Genus PHOLCUS, Walck.

100. *Pholcus phalangioides*.

Pholcus phalangioides, Walck. Hist. Nat. des Insect. Apt. t. i. p. 652;

Latr. Gen. Crust. et Insect. tom. i. p. 99; Hahn, Die Arachn.

B. ii. p. 34. tab. 50. fig. 119; Koch, Uebers. des Arachn. Syst.

erstes Heft, p. 20; Blackw. Linn. Trans. vol. xix. p. 125.

— *opilionoides*, Koch, Die Arachn. B. iv. p. 95. tab. 135. fig. 311.

Living specimens of *Pholcus phalangioides* were brought to me

from Barmouth, in Merionethshire, in the summer of 1835, by Richard Potter, Esq., M.A., of Queen's College, Cambridge, and Professor of Natural Philosophy in University College, London. In 1836 I received an adult male from Mr. T. Glover, which he had taken in Liverpool, and I have in my possession an immature individual from the Isle of Wight.

The spider referred to by Mr. Jesse in his 'Scenes and Tales of Country Life,' pp. 202, 203, as remarkable for the rapidity of its vibratory motions when disturbed, is, I have no doubt, *Pholcus phalangioides*, which frequents ancient buildings in the south of England, and like *Epëira diadema*, *Theridion quadri-punctatum*, and some other species, has the habit of violently agitating itself when anything suddenly touches its lines. This vibratory motion, which in the case of *Pholcus phalangioides* appears to acquire its maximum velocity, is produced by the partial contraction and extension of the joints of the legs in quick succession, as I have ascertained by occasioning specimens of *Epëira diadema* to continue the action till it became so slow, in consequence of the fatigue experienced by the animals, that there was no difficulty in determining the manner in which it is effected. This singular proceeding is evidently intended by the spider to communicate motion to its snare and thus to cause the struggles of any insect entangled in it, by which means it is directed with certainty to its victim.

Family *Linyphiida*.

Genus LINYPHIA, Latr.

101. *Linyphia montana*.

Linyphia montana, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 233. pl. 16. fig. 4; Koch, Uebers. des Arachn. Syst. erstes Heft, p. 10; Die Arachn. B. xii. p. 113. tab. 422. fig. 1038, 1039.
 — *triangularis*, Latr. Gen. Crust. et Insect. tom. i. p. 100; Sund. Vet. Acad. Handl. 1829, p. 215.

This very common spider, which is frequently mistaken for *Linyphia triangularis*, constructs in hedges, bushes and rank herbage an extensive horizontal sheet of web of a fine texture, on the inferior surface of which it takes its station in an inverted position and watches for its prey. Connected with the web and with objects situated above and below it are numerous fine lines intersecting one another at various angles; those on the upper side are the most extensive, and not only serve to support the web, but also to precipitate such insects as strike against them with their wings upon the horizontal sheet, where they are quickly seized by the vigilant and active occupant.

102. *Linyphia triangularis*.

Linyphia triangularis, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 240.
 — *marginata*, Wider, Museum Senckenb. B. i. p. 253. taf. 17.
 fig. 5; Koch, Die Arachn. B. xii. p. 118. tab. 423. fig. 1041,
 1042.

Linyphia triangularis occurs in the south-eastern counties of England, but I have not met with it in the northern counties, nor in Wales.

103. *Linyphia marginata*.

Linyphia marginata, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. iii. p. 346; Research. in Zool. p. 394.
 — *montana*, Sund. Vet. Acad. Handl. 1829, p. 217.
 — *resupina*, Wider, Museum Senckenb. B. i. p. 252. taf. 17. fig. 4;
 Walck. Hist. Nat. des Insect. Apt. t. ii. p. 242; Koch, Die Arachn. B. xii. p. 109. tab. 421. fig. 1035, 1036.
Titulus 19, Lister, Hist. Animal. Angl. De Aran. p. 64. tab. 1. fig. 19.

In its habits and œconomy this species resembles *Linyphia montana*, fabricating in low bushes or among coarse herbage an extensive snare similar in design to the toils constructed by the *Linyphiae* generally. It pairs in May, and in June the female spins one or two lenticular cocoons of white silk of a loose texture which are attached to withered leaves, or other objects situated near the snare; the larger of these cocoons measures $\frac{1}{2}$ an inch in diameter, and contains about 140 spherical eggs of a pale yellow colour, not agglutinated together.

104. *Linyphia pratensis*.

Linyphia pratensis, Wider, Museum Senckenb. B. i. p. 258. taf. 17.
 fig. 8; Walck. Hist. Nat. des Insect. Apt. t. ii. p. 250; Koch,
 Die Arachn. B. xii. p. 121. tab. 423. fig. 1043.
 — *sylvatica*, Blackw. Linn. Trans. vol. xviii. p. 659.

Since the publication of my description of this spider, under the specific name of *sylvatica*, in the eighteenth volume of the 'Transactions of the Linnæan Society,' the suspicion of its identity with the *Linyphia pratensis* of M. Wider, there expressed, has been converted into absolute certainty by consulting M. Reuss's memoir entitled 'Arachniden,' contained in the first volume of the 'Museum Senckenbergianum;' consequently the appellation bestowed upon it by me must rank as a synonym. It will be seen that this opinion has been adopted by M. Walckenaer, on referring to his 'Hist. Nat. des Insect. Apt.' t. iv. p. 499.

This species is common in England and Wales, and in the spring of 1849 an immature male, which had not undergone its final change of integument, was forwarded to me by Mr. J. Hardy,
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who captured it in Berwickshire. Its snare is usually constructed among rank herbage growing in and near woods, and it pairs in May and June.

105. *Linyphia fuliginea*.

Linyphia fuliginea, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. iii. p. 349; Research. in Zool. p. 401.

Linyphia fuliginea is found in various parts of North Wales and Lancashire; it pairs in June, and constructs a snare of moderate dimensions among the grass of meadows and pastures. The male closely resembles the male of *Linyphia pratensis*, but may be distinguished from it by its inferior size, and by the structure of its palpal organs.

106. *Linyphia rubea*.

Linyphia rubea, Blackw. Linn. Trans. vol. xviii. p. 661.

In the months of May and June this spider spins a web of moderate extent among bushes in woods and coppices in North Wales and Lancashire, where it is not uncommon. An immature female of this species was transmitted to me from Berwickshire by Mr. J. Hardy in December 1848.

XXXVI.—Description of a new species of *Pterocyclos*, Benson, from Southern India. By W. H. BENSON, Esq.

Pterocyclos nanus, nobis, n. s.

Testa profunde perspective umbilicata, depressa, discoidea, albida, fascia media strigisque undulatis castaneis superne ornata; spira prominula, saturiore; anfractibus $4\frac{1}{2}$ convexis, ultimo supra soluto; apertura obliqua, circulari; peristomate duplicata, marginibus sulco leviter impresso vix discretis, interno superne profunde recteque inciso, externo reflexiusculo, supra sinum alam angustam fornicatam, antice breviter descendentem, angulatam, formante.

Diam. major 10, minor 8, alt. 5 mill.

Hab. ad basin montium "Nilgherries," Indiæ Australis.

This interesting addition to the genus was sent to me by Dr. Jerdon with specimens of *Pterocyclos bilabiatus*, Sow. Possessing a similar deep umbilicus, narrower than in the other known species, it was overlooked as a young and imperfect specimen. On examination it proves to have arrived at its full growth, being allied in the characters of the aperture to *Pt. ruperstris*, nobis, but differing from the smallest varieties of that shell not only in size and in the form of the umbilicus, but also in the less curvature of the incision under the wing, which is more-over less expanded, and does not touch nor cover any part of the preceding whorl. The operculum is unknown.

London, November 8th, 1851.